

CLAIMS

What is claimed is:

24. A filter comprising

5 a filter media; and
 a filter housing, the housing comprising
 a first port,
 a second port,
 a first flow path located between the first port and the second port, the first flow
10 path having at least one filter inlet opening within the filter housing, so that a
 portion of the flow through the first flow path may enter the filter housing,
 a third port,
 a fourth port, and
 a second flow path located between the third port and the fourth port, the second
15 flow path having at least one filter outlet opening within the filter housing, so that
 the flow through the first flow path may flow through the filter media, through the
 filter outlet opening, and into the second flow path, wherein the first flow path is
 countercurrent to the second flow path.

20 25. An engine coolant filter system comprising

 an engine coolant;
 a water pump;
 an engine block;

a heater core;

a filter subassembly comprising

a filter media; and

a filter housing, the housing comprising

5 a first port,

a second port,

a first flow path located between the first port and the second port, the first

flow path having at least one filter inlet opening within the filter housing,

so that a portion of the flow through the first flow path may enter the filter

10 housing,

a third port,

a fourth port, and

a second flow path located between the third port and the fourth port, the

second flow path having at least one filter outlet opening within the filter

15 housing, so that the flow through the first flow path may flow through the

filter media, through the filter outlet opening, and into the second flow

path;

a first heater core supply hose for providing engine coolant from the engine block to the
first port;

20 a second heater core supply hose for providing engine coolant from the second port to the
heater core;

a first heater core return hose for providing engine coolant from the heater core to the
third port; and

a second heater core return hose for providing engine coolant from the fourth port to the water pump, wherein the first heater core supply hose and the first heater core return hose are arranged in a countercurrent configuration such that the first port and the fourth port are located on a first side of the filter housing, and the second port and the third port
5 located on a second side of the filter housing, and the second side is essentially opposite of the first side.

26. The filtering system of claim 25 wherein
the filter housing is plastic.

10 27. The system of claim 25 wherein
the filter housing may be opened; and
the filter media may be replaced.

15 28. The system of claim 27 wherein
the filter housing is threaded, such that the filter housing may be opened by unscrewing
the housing.

29. The system of claim 25 wherein
20 the filter media is paper.

30. The system of claim 25 wherein the supply line inlet port further comprises
a nipple, such that the first heater core supply hose may be clamped to the nipple.

31. The filtering system of claim 24 wherein
the filter housing is plastic.

5 32. The system of claim 24 wherein
the filter housing may be opened; and
the filter media may be replaced.

33. The system of claim 24 wherein
10 the filter housing is threaded, such that the filter housing may be opened by unscrewing
the housing.

34. The system of claim 24 wherein
the filter media is paper.

15 35. A filter for a closed loop fluid system, the filter comprising
a filter media having a first surface and a second surface, such that a fluid may pass from
the first surface, through the media, and to the second surface, thereby filtering
particulates from the fluid, and

20 a housing comprising
a supply line inlet port,
a supply line exit port,
a supply passage between the supply line inlet port and the supply line exit port,

at least one supply passage opening in the supply passage, such that a fluid may pass through the passage opening to the first surface of the media,

a return line inlet port,

a return line exit port,

5 a return passage between the return line inlet port and the return line exit port, and

at least one return passage opening in the return passage, such that a fluid may pass from the second surface of the media through the return passage opening to the return line exit port,

such that a fluid may pass from the supply line inlet port, and a first portion of the

10 fluid may pass through the supply passage, out the supply line exit port, through a

pressure drop device, through the return line inlet port, through the return passage,

and through the return line exit port, and a second portion of the fluid may pass

through the supply passage opening, through the media, through the return

passage opening, and through the return line exit port, such that the supply line

15 and return line are arranged in a countercurrent configuration such that the supply

line inlet port and the return line exit port are located on a first side of the filter

housing, and the supply line exit port and the return line inlet port are located on a

second side of the filter housing, and the second side is essentially opposite of the

first side.

20 36. The filtering system of claim 35 wherein

the pressure drop device is a heater.

37. The system of claim 35 wherein
the filter housing is plastic.

38. The system of claim 35 wherein

5 the filter housing may be opened; and
the filter media may be replaced.

39. The system of claim 35 wherein
the filter media is paper.

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40. A method of filtering a portion of the flow in a closed fluid loop, the method comprising
providing a fluid supply line with a first section and a second section;
providing a fluid return line with a first section and a second section, the fluid supply line
having a higher pressure than the fluid return line;
15 positioning a filter housing between the first section and the second section of the fluid
supply line and between the first section and the second section of the fluid return line,
the filter housing containing a filter media;
providing a supply line bypass through the filter housing between the first section and the
second section of the fluid supply line, so that a first portion of supply line fluid flows
20 through the supply line bypass;
providing a return line bypass through the filter housing between the first section and the
second section of the fluid return line, so that the first portion of supply line fluid flows
through the return line bypass;

providing at least one opening in the supply line bypass to provide a second portion of the supply line flow to a filter media surface; and
providing at least one opening in the return line bypass to provide the second portion of filtered supply line flow from the filter media surface.

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41. A method of filtering a fluid in a portion of a closed fluid loop, the portion of the closed fluid loop having a pressure drop device that is occasionally operative and a fluid supply line to the pressure drop device and a fluid return line from the pressure drop device, the method comprising

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providing a filter having

a fluid supply line inlet port,

a fluid supply line outlet port,

a supply passage between the fluid supply line inlet port and the fluid supply line outlet port,

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a fluid return line inlet port,

a fluid return line outlet port,

a return passage between the fluid return line inlet port and the fluid return line outlet port,

a filter media, and

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a flow path from the supply passage through the filter media to the return passage;

installing the filter in a countercurrent manner between the fluid supply line and the fluid return line;

filtering a portion of the fluid flowing through the fluid supply line when the pressure

drop device is operative by

flowing a first portion of the flow from the inlet supply port through the supply passage, through the pressure drop device, and through the return passage, and

flowing a second portion of the flow from the inlet supply port through the flow

5 path from the supply passage through the filter media to the return passage; and

filtering the fluid flowing through the fluid supply line when the pressure drop device is

not operative by

flowing the flow from the inlet supply port through the flow path from the supply

passage through the filter media to the return passage.